DRAFT

December 9, 2020

Project Portal Cover Page

To:	USEPA
Cc:	NCG, NYC
From:	David Haury, Anchor QEA, LLC
Re:	NCG Proposed Path Forward: OU1 and OU3 Interim Risk-Based PRG Development Process and Consideration of Background

The following are attached for submittal to USEPA:

- A memorandum, entitled "NCG Proposed Path Forward: OU1 and OU3 Interim Risk-Based PRG Development Process and Consideration of Background memorandum," which summarizes the proposal for moving the interim risk-based PRG development process forward and integrating considerations of background into the alternatives development process
- The slide deck from the December 3, 2020 USEPA check-in meeting, entitled "USEPA Discussion: PRGs and Early Action"

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ANCHOR QEA

Memorandum

December 9, 2020

To: U.S. Environmental Protection Agency

From: Newtown Creek Group

Re: NCG Proposed Path Forward: OU1 and OU3 Interim Risk-Based PRG Development Process and Consideration of Background

Introduction

The purpose of this memorandum is to summarize the proposal for moving the interim risk-based preliminary remediation goal (PRG) development process forward and integrating considerations of background into the alternatives development process, as discussed during the conference call between the U.S. Environmental Protection Agency (USEPA) and the Newtown Creek Group (NCG) on November 24, 2020, and presented to the larger stakeholder group on December 3, 2020.

The following sections of this memorandum discuss: 1) the NCG's PRG-related proposal for Operable Unit 1 (OU1) and Operable Unit 3 (OU3); and 2) a proposed approach for evaluating the contribution of ongoing contaminant sources to future long-term equilibrium surface sediment concentrations (i.e., site-specific background conditions). The NCG believes that including both interim risk-based PRGs and estimates of long-term equilibrium surface sediment concentrations in the Feasibility Study (FS) alternatives development process is necessary to ensure a complete and comprehensive evaluation of remedial alternatives.

The proposed path forward described in this memorandum impacts two distinct aspects of the Newtown Creek Remedial Investigation/Feasibility Study process: 1) the OU1 FS background derivation and alternatives development process; and 2) the OU3 Early Action (EA). Although both of these processes will not be completed in the immediate future, given the schedule proposed in this memorandum for developing quantitative estimates of long-term equilibrium conditions that are necessary for background derivation, this work needs to begin immediately. As such, the NCG requests that USEPA provide concurrence with the proposed path forward by December 18, so that this work can meet the proposed schedule. Should further discussion of some of the specifics within the approach need to be discussed, we encourage that discussion to occur the week of December 14.

Interim Risk-Based PRGs

For purposes of establishing interim risk-based PRGs for OU1, and how those values relate to the remedial action levels (RALs) established for OU3, the NCG proposes the following:

- The NCG will use USEPA's proposed interim total polycyclic aromatic hydrocarbon (34) (TPAH [34]) PRG of 100 milligrams per kilogram (mg/kg) and the C19-C36 aliphatics unadjusted PRG of 200 mg/kg. These two contaminants of concern (COCs) encompass the types of adverse effects that can potentially be attributed to exposure of benthic organisms to all three hydrocarbon COCs. As a result, there is no basis to carry forward development of PRGs for total petroleum hydrocarbon (TPH) and diesel range organics (DRO) for OU1 or OU3 for the following reasons:
  - TPAH (34) and C19-C36 aliphatics unadjusted encompass the potential types and range of effects caused by exposure to hydrocarbon compounds.
  - TPH and DRO include polycyclic aromatic hydrocarbon compounds and are not independent measures of effects.
  - TPH and DRO do not provide any additional information regarding the definition of remedial footprints in areas of identified unacceptable risk to the benthic community.
- The NCG also will use USEPA's proposed interim risk-based PRG for copper of 490 mg/kg.
- In summary, the NCG proposes that the interim risk-based PRGs that will be carried forward into the OU1 FS alternatives development process will be TPAH (34) of 100 mg/kg, C19-C36 aliphatics unadjusted of 200 mg/kg, copper of 490 mg/kg, and the interim risk-based PRGs for total polychlorinated biphenyl (TPCB), dioxin/furan toxic equivalence quotient (total dioxin/furan TEQ), and lead as included in the 2019 interim risk-based PRG document submitted by the NCG (Anchor QEA 2019).
- While the OU1 process addresses PRGs, and the OU3 process address RALs, the two are inter-related because the interim risk-based PRGs for TPAH (34), copper, and C19-C36 aliphatics unadjusted are not-to-exceed values, they are equivalent to RALs. Therefore, for purposes of OU3, which is based on RALs, the NCG proposes modifying the RAL values to be consistent with the OU1 PRGs for those compounds where the interim risk-based PRG is essentially a not-to-exceed RAL-type value. Specifically, the RALs for OU3 will be modified to be TPAH (34) of 100 mg/kg, C19-C36 aliphatics unadjusted of 200 mg/kg, and copper of 490 mg/kg. No modification is appropriate for the TPCB RAL of 1.2 mg/kg.
- Figure 1 shows the areas in OU1 that exceed PRGs/RALs for TPAH (34), TPCB, copper, and C19-C36 aliphatics unadjusted. The figure also shows areas where TPH and DRO exceed the USEPA's proposed interim risk-based PRGs for TPH and DRO but the PRGs for other COCs are not exceeded (in Figure 1 note that the yellow-shaded polygons also contain areas where C19-C36 aliphatics unadjusted, TPH, or DRO exceed their PRGs, and the blue-shaded polygons also contain areas where TPH or DRO exceed their PRGs).

- Relative to the OU3 EA, the NCG will revise the OU3 EA footprint in the next draft of the OU3 draft *Focused Feasibility Study* (FFS; Anchor QEA 2020a) to encompass those areas where the following interim risk-based PRGs/RALs are exceeded: TPAH (34) = 100 mg/kg, TPCB = 1.2 mg/kg, copper = 490 mg/kg, and C19-C36 aliphatics unadjusted = 200 mg/kg (i.e., in Figure 1, the yellow and blue polygons in creek mile [CM] 0–2). The NCG believes it is important to point out that the 28-day survival test results for all of the triad stations from CM 0–1.7 surpass USEPA's acceptability criteria of 75% survival, even in those areas where the hydrocarbon COCs exceed USEPA's proposed values (see Figure 2, which is Figure 8-15 from the *Baseline Ecological Risk Assessment* [BERA; Anchor QEA 2018]). Due to the addition of the C19-C36 aliphatics unadjusted COC, the footprint in OU3 will significantly expand (see Table 1). Therefore, the NCG proposes that the upstream boundary of the EA footprint be scaled back from CM 2.0 so that the overall EA spatial extent and removal volume estimates do not exceed the limits set forth in the Scope of Work (SOW) after adding the additional acreage required to address areas where C19-C36 aliphatics unadjusted exceed its PRG. The spatial extent and volume estimates are based on the 2-foot depth removal assumption; requirements to remove material deeper than 2 feet will significantly affect the size of the EA footprint. The rationale for this modification is that it will bring the EA into alignment with the potential for it to be considered as a long-term remedy when the OU1 FS process ultimately evaluates the entire site, because it will include all of the COCs (with the addition of aliphatics) that are embodied in the OU1 FS process. While the shift in the upstream boundary to a slightly smaller footprint helps to align the project within the parameters of the OU3 SOW, it also eliminates the upper portion of the OU3 footprint, which is an area that has drawn comments from a number of stakeholders. The NCG believes this approach will help mitigate some of the concerns expressed by the New York State Department of Environmental Conservation and the Contaminated Sediment Technical Advisory Group and preserve the progress USEPA and the NCG have made to potentially begin remediation of the creek sooner.

Table 1
OU3 EA Remedial Footprint

EA Permutation	Approximate Area (acres)	Estimated Removal Volume (cubic yards)
FFS	11.7	57,000
FFS with TPAH (34) PRG of 100 mg/kg, and including TPCB = 1.2 mg/kg and copper = 490 mg/kg	12.2	59,000
TPAH (34) PRG of 100 mg/kg, TPCB = 1.2 mg/kg, copper = 490 mg/kg, and C19-C36 aliphatics unadjusted = 200 mg/kg	23.3	113,000
SOW guardrail 100,000 cubic yards	20.7	100,000
SOW guardrail 17.4 acres	17.4	84,000

Benefits of Proposed Path Forward on PRGs

The NCG believes that its proposed path forward for the completion of the interim risk-based PRG process, in conjunction with an expedited consideration of background, will result in a more complete alternatives development process, with concurrent benefits to the overall project schedule. Specifically, some of the more important benefits of the proposed path forward are as follows:

- Eliminates further technical discussions and disagreements regarding the TPAH (34) and hydrocarbon PRG development process
- Integrates USEPA "hydrocarbon" concerns into the OU3 EA footprint, including the area in CM 0–1.7 where the 28-day survival test results for all of the triad stations surpassed USEPA's acceptability criteria of 75% survival
- Addresses toxicity concerns in heads of tributaries (OU1) potentially due to aliphatic hydrocarbons
- Allows OU3 EA to proceed on schedule
- Streamlines the OU1 interim risk-based PRG process and, with the incorporation of background conditions (see following section), will expedite a robust alternatives development process with resulting significant positive schedule implications
- The alternatives development process cannot be completed without finalization of the interim risk-based PRGs and quantification of background

Background Considerations

The proposed path forward for PRGs presented in this memorandum comprises much of the four-step risk management process outlined in the email from Caroline Kwan on October 22, 2020

(Kwan 2020). However, the NCG believes that considerations of site-specific background should be included in the risk management process, so that it can be also included quantitatively in the alternatives development process, including the evaluation of remedy effectiveness. To accomplish this objective, an evaluation of the relative importance of ongoing external inputs to the Study Area and quantifying the contribution of these inputs to long-term equilibrium surface sediment COC concentrations should proceed expeditiously. The NCG believes that the necessary data and existing models are currently available to complete these analyses and develop interim background value ranges. The NCG understands that finalization of the hydrodynamic/sediment transport model and the chemical fate and transport (CFT) model will be needed to refine any estimates made in the short term, but believes the alternatives development process requires estimates of site-specific background conditions in order to effectively develop and evaluate alternatives. Toward that end, the NCG proposes to follow the two-step process that is depicted in Figure 3 and summarized as follows:

1. **Identify Ranges of Ongoing Sources.** The first step in the process involves identification of a range of input values that will be used to quantify the contribution of COCs associated with each ongoing source category. The ongoing source categories considered will be those already identified by USEPA in its "Ongoing Inputs Bracketing Table" (provided in email dated November 16, 2020, from Anne Rosenblatt [Rosenblatt 2020]). The contribution of each source category will be based primarily on information (e.g., concentration data, flow rates, loading calculations) documented in the June 2020 draft *Remedial Investigation Report* (RI Report; Anchor QEA 2020b) and the New York City Department of Environmental Protection *Long Term Control Plan* (LTCP; NYCDEP 2017). For sources that represent a loading of solids that meaningfully contribute to ongoing net sedimentation, measurements or calculated estimates of the COC concentration associated with those solids have been made previously. For sources that do not represent a significant solids input and/or are associated with a dissolved phase input mechanism (e.g., lateral groundwater inflow), the ranges would be based on COC mass loading estimates. The specific datasets and methods used to establish these ranges would be developed by the NCG and presented to USEPA prior to submittal of the results of the evaluation in late-February 2021.
2. **Calculate Interim Range of Background Values.** In the second step, the ranges from the prior step will be input to a spreadsheet model that uses that information in conjunction with predictions from the sediment transport model[1] to predict long-term equilibrium surface sediment COC concentrations. This spreadsheet model is based on mass balance principles and approximates the results that will ultimately be generated by the more sophisticated CFT model based on an understanding of that model's fundamental behavior and the Study Area

[1] It is recognized that the sediment transport model is currently under revision, and documentation of the revised model in the 2021 *Final Modeling Results Memorandum* (FMRM; Appendix G to the RI Report) is also a work in progress. As such, the spreadsheet model calculation will be based on model results from a previous version of the FMRM. It is anticipated that the results from the spreadsheet model will not change significantly as a result of incorporating the revised sediment transport model results, which will be done as soon as is practicable.

conceptual site model (see Section 8 of the draft RI Report). This spreadsheet model was used previously to evaluate future equilibrium concentrations as part of the NCG's comments on the draft LTCP (NCG 2017). This quantitative framework will allow for an assessment (e.g., through sensitivity analysis/bounding calculations) of which ongoing sources are major contributors versus those that are *de minimis*. The spreadsheet will be set up to perform calculations at the reach level of Newtown Creek. Thus, the spreadsheet model will provide a means of considering whether long-term equilibrium values would exhibit large spatial variation. The calculations performed with the spreadsheet model will be developed for two scenarios—current conditions and future conditions (e.g., following implementation of future CSO reductions in the LTCP). Finally, the spreadsheet model framework will include development of equilibration curves that provide an estimate of the timeframe over which long-term equilibrium concentrations will be established. Details on the spreadsheet model setup would be presented to USEPA prior to submission of the model results in mid-April 2021.

References

Anchor QEA (Anchor QEA, LLC), 2018. *Baseline Ecological Risk Assessment*. Remedial Investigation/Feasibility Study, Newtown Creek. October 2018.

Anchor QEA, 2019. *Development of Risk-Based Preliminary Remediation Goals*. Newtown Creek Early Action, OU3 FFS. December 2019.

Anchor QEA, 2020a. *Focused Feasibility Study*. Draft. Newtown Creek Early Action, Operable Unit 3. March 2020.

Anchor QEA, 2020b. *Remedial Investigation Report*. Draft. Remedial Investigation/Feasibility Study, Newtown Creek. June 2020.

Kwan, C., 2020. Regarding: PRG technical meeting. Email to: David Haury (Anchor QEA, LLC); Chitra Prabhu (HDR). October 22, 2020.

NCG (Newtown Creek Group), 2017. Letter to: New York State Department of Environment and Conservation and New York City Department of Environmental Protection. Regarding: Comments on the Newtown Creek LTCP. Newtown Creek Remedial Investigation/Feasibility Study. Appendix A3: Analysis of Future Surface Sediment Chemical Equilibrium Concentrations. August 14, 2017.

NYCDEP (New York City Department of Environmental Protection), 2017. *Combined Sewer Overflow Long Term Control Plan for Newtown Creek*. Capital Project No. WP-169. June 2017.

Rosenblatt, A., 2020. Regarding: Newtown Creek – Revised Ongoing Inputs Table. Email to: Simeon Hahn (National Oceanic and Atmospheric Administration); Ron Weissbard (New York City Department of Environmental Protection); Ian Beilby (New York State Department of Environmental Conservation); Daniel Gefell (U.S. Fish and Wildlife Service); Tom Schadt (Anchor QEA, LLC); and Chitra Prabhu (HDR). November 16, 2020.

Figures

Figure 1
Surface Sediment Area Thiessens that Exceed USEPA PRGs – Comparison 3 Overview

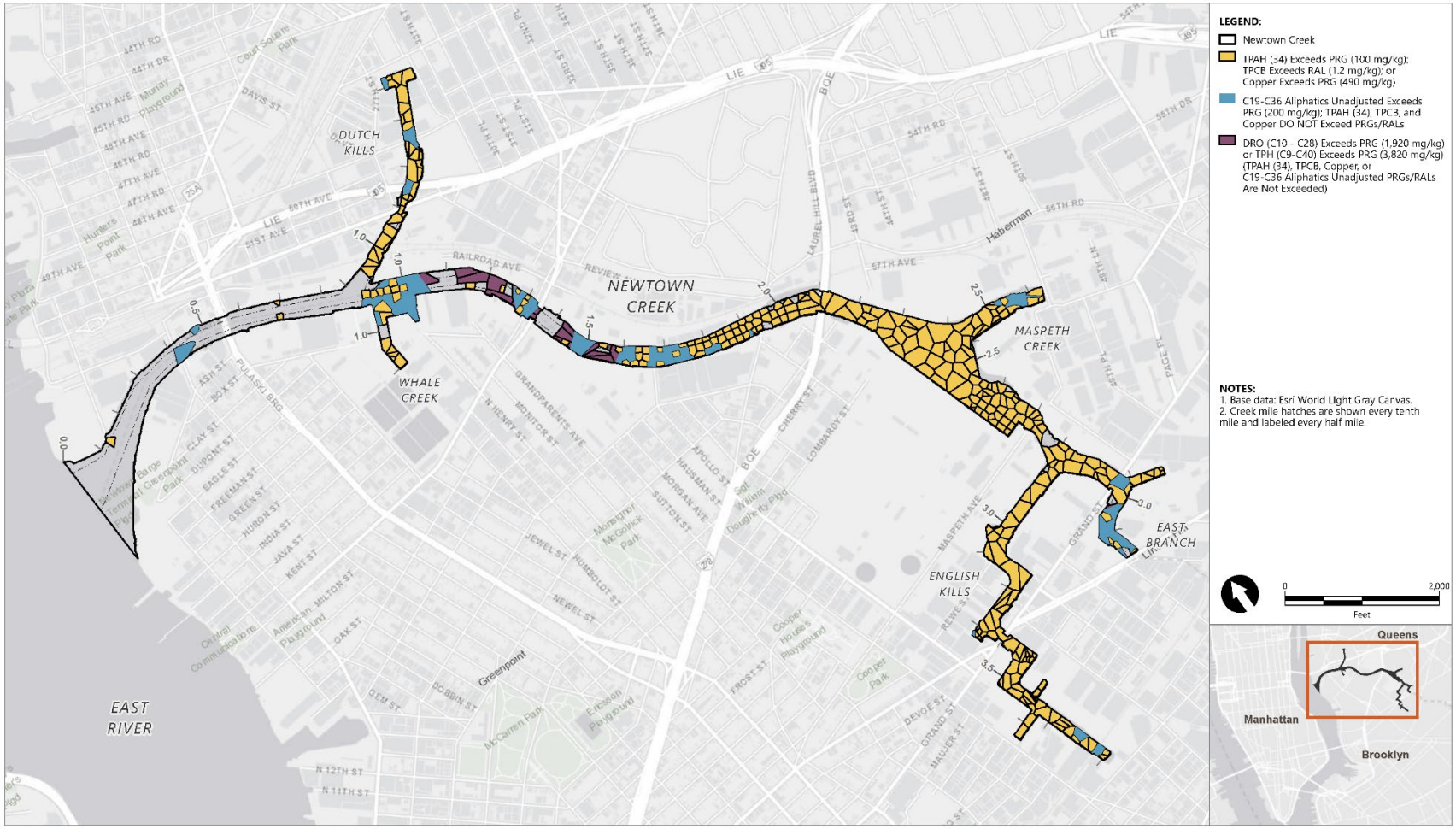


Figure 2
28-Day Survival Reference Envelope (n=48) Comparison by Study Area CM (BERA Figure 8-15)

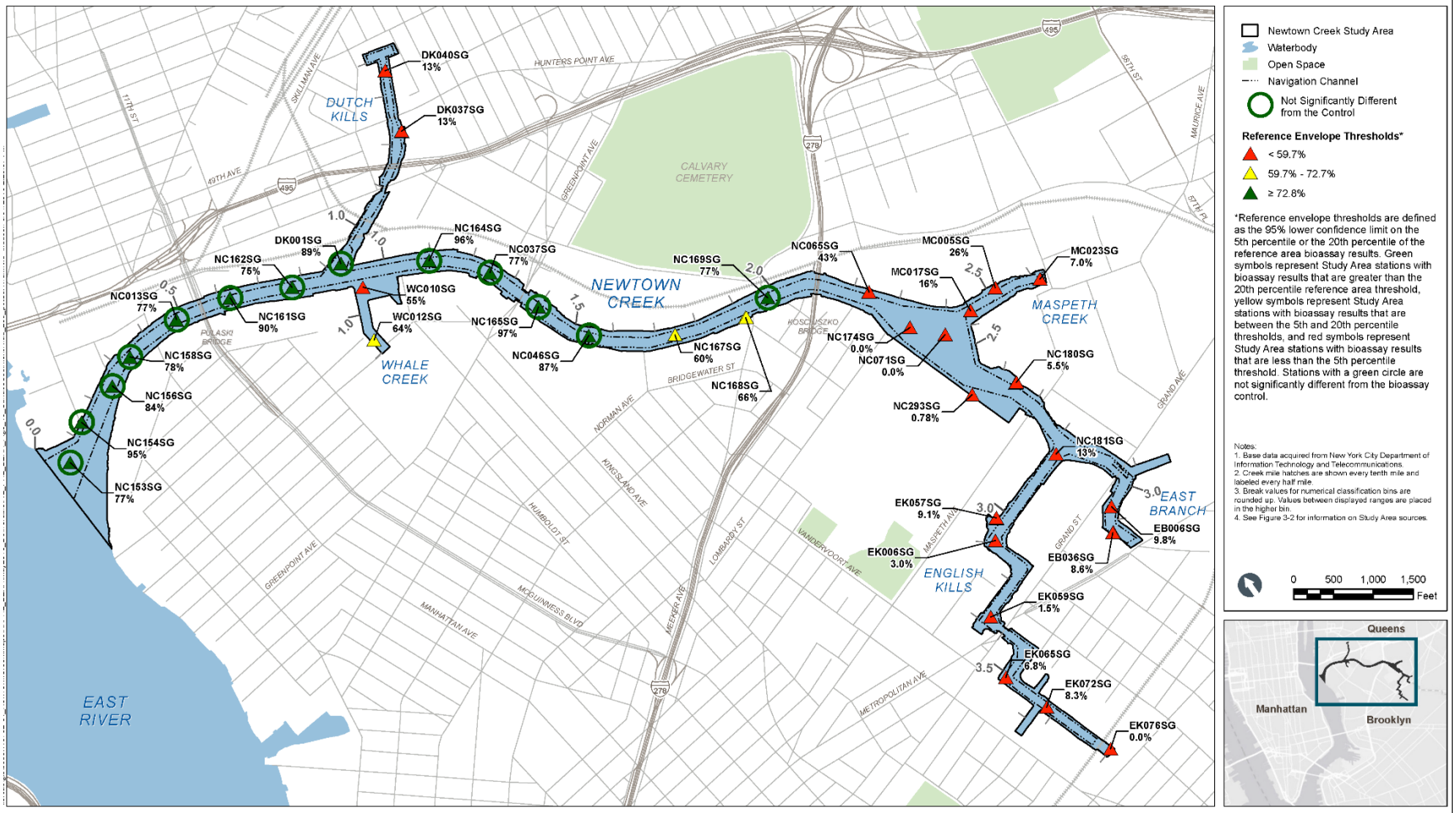
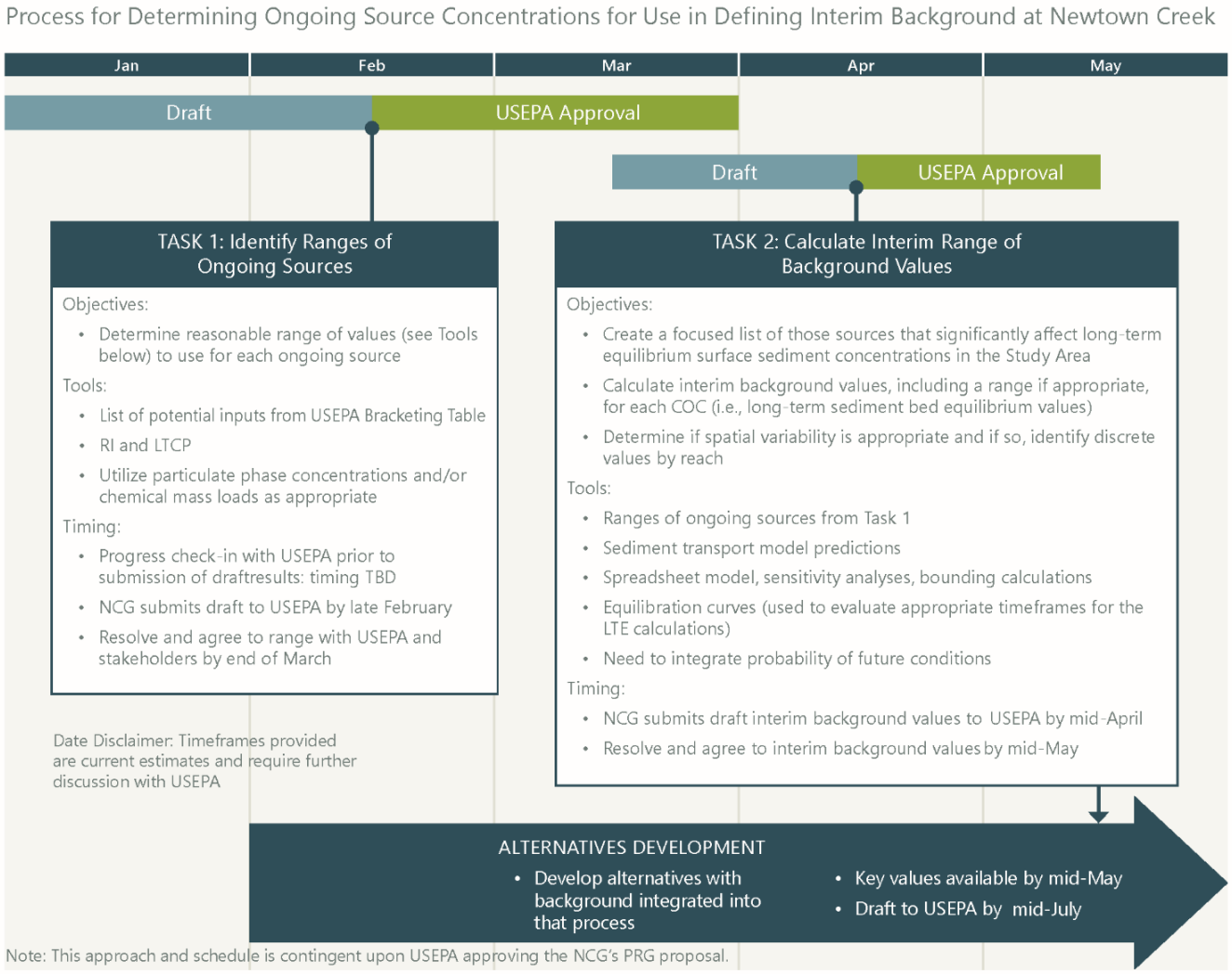


Figure 3
Process for Determining Ongoing Source Concentrations for Use in Defining Interim Background at Newtown Creek



USEPA Discussion: PRGs and Early Action

ANCHOR QEA

December 3, 2020

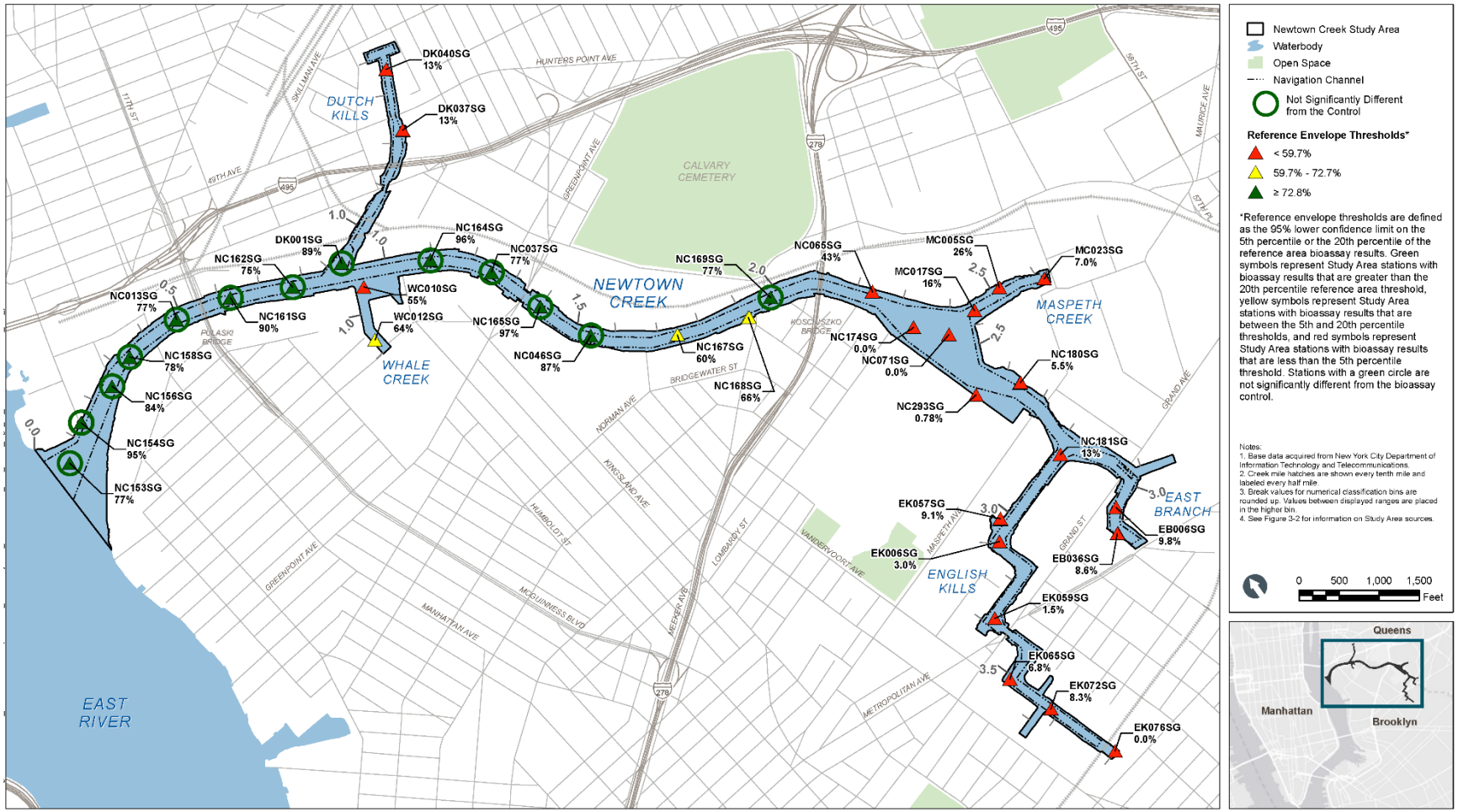
NCG's Proposal for PRGs and RALs

- Interim risk-based PRGs for OU1: TPAH (34), TPCB, copper, C19-C36 aliphatics
  - Also includes dioxins/furans and lead
- Agree to adopt RALs for four COCs in OU3 (results in footprint increase)
  - TPCB = 1.2 mg/kg
  - TPAH (34) = 100 mg/kg
  - Copper = 490 mg/kg
  - C19-C36 = 200 mg/kg
- Integrates risk and background considerations
- Eliminates the need for DRO and TPH PRGs
- Apply an expanded monitoring process and adaptive management principles of "do and learn" for OU1
- Background also needs to be integrated into OU1 risk management step

Benefits of the NCG Proposal

- Eliminates ongoing technical disagreements regarding the TPAH (34) and hydrocarbon PRG development process
- Integrates USEPA "hydrocarbon" concerns into the OU3 EA footprint…adds the area in CM 0–1.7 with no unacceptable benthic toxicity
- Allows OU3 EA to proceed on schedule
- Streamlines the OU1 interim PRG process, incorporates background, expedites a robust alternatives development process
- Addresses toxicity concerns in heads of tributaries (OU1) potentially due to aliphatic hydrocarbons

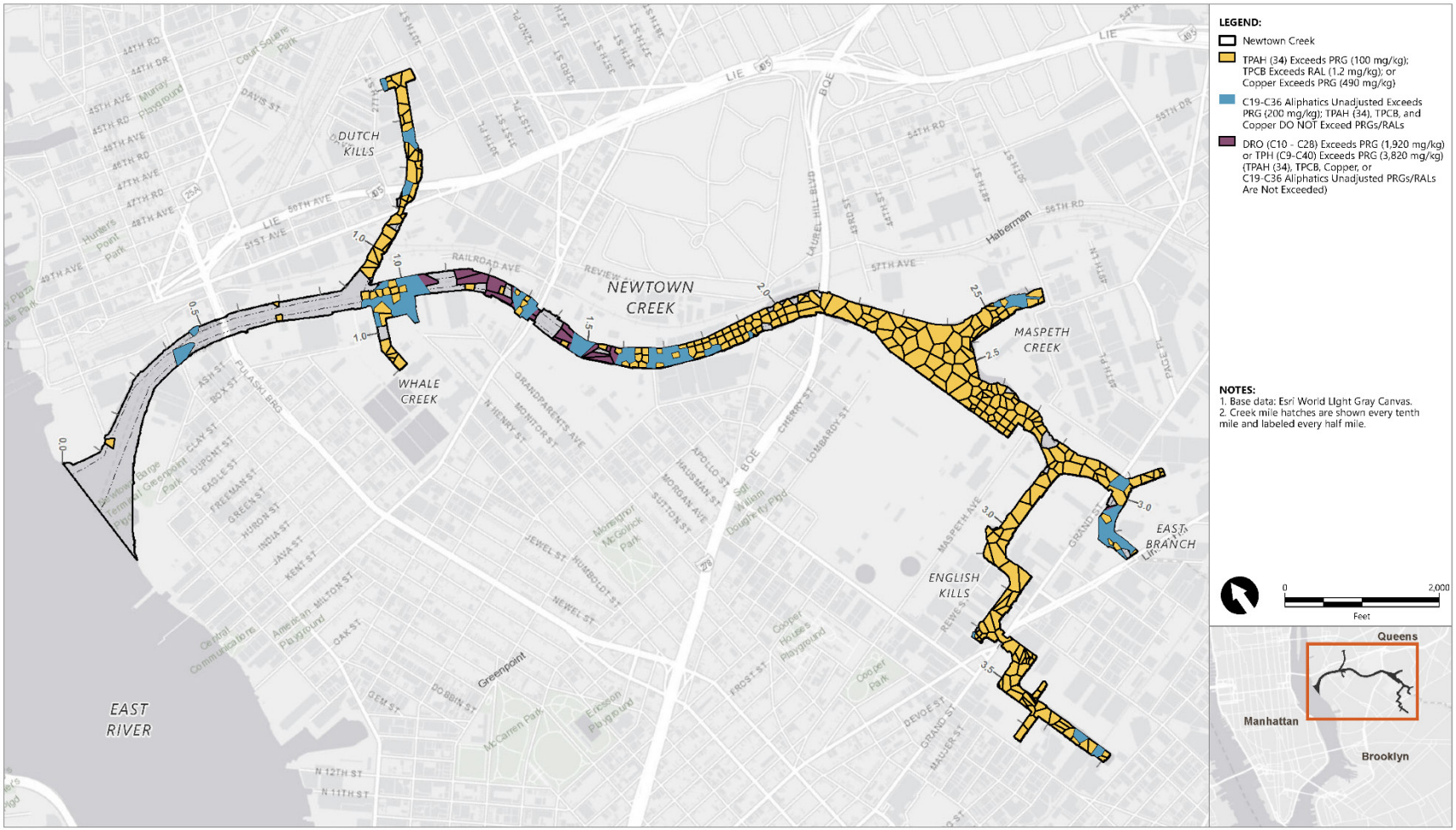
28-Day Survival Reference Envelope (n=48) Comparison by Study Area CM (BERA Figure 8-15)



Rationale for Incorporating C19-C36 Aliphatics, But Not TPH or DRO

- TPAH (34) and C19-C36 encompass the potential types and range of effects caused by exposure to hydrocarbon compounds
- TPH and DRO include PAH compounds and are not independent measures of effect
- TPH and DRO do not provide any additional information regarding the definition of remedial footprints in areas of measured unacceptable risk to benthic community

Surface Sediment Area Thiessens that Exceed USEPA PRGs – Comparison 3 Overview



OU3 Footprint Summary

EA Permutation	Approximate Area (acres)	Estimated Removal Volume (cy)
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SOW guardrail 100,000 cy	20.7	100,000
SOW guardrail 17.4 acres	17.4	84,000

- Due to guardrail exceedances, modify upper end boundary to < CM 2.0 marker

Consideration of Background

- USEPA's October 2017 and 2019 memoranda recognize the importance of Newtown Creek site-specific background and reference areas
- Defining background quantifies the contribution of ongoing external inputs to post-remedy long-term equilibrium surface sediment COC concentrations
- USEPA's bracketing table is first step to qualitatively evaluate relative source importance – now/future
- Quantifying the relative importance and calculating long-term equilibrium concentrations is an important part of the PRG development process and is possible to do now using existing data and models

Schedule Benefits

- Alternatives development process cannot be completed fully without finalization of interim PRGs and quantification of background
- NCG's proposal to streamline PRG process and to initiate quantifying long-term equilibrium concentrations has significant positive schedule implications

Next Steps

- If accepted, determine how to memorialize the proposal
- Simplifies risk-based PRG setting process by utilizing proposed values
- Move to "next step" and integrate background into PRGs such that alternatives development proceeds expeditiously
- Shift bracketing table focus from qualitative to quantitative
- Proceed with modifying OU3 FFS accordingly

Questions/Discussion